

# SCIENCE-BASED INDUSTRIAL PARKS

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## SCIENCE PARK DESCRIPTION

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Science-based industrial parks (SBIP) are a concept now more than ten years old. Since 1980 when the first one was commissioned in Taiwan, they've become popular throughout Southeast Asia and other places but have yet to gain a foothold in the U.S.

Science-based industrial parks are less research oriented than parks intended to develop science and technology, and more oriented toward industrial development where the emphasis is on commercializing technology. Designed principally to help move a country, region, or industry from a basis of low-cost labor to one of technology, they may produce computers, related hardware, software, and other products.

A secondary benefit of an SBIP is its ability to create companies that can compete on a global scale. Primarily due to the worldwide nature of a park's marketing search, the companies that do join are from the outset oriented toward a global market. A third benefit and an important windfall is real estate development. Parks may cover 1000 acres or more and require extensive super- and infrastructures.

SBIP's are generally built around a specific technology or industry that supplies a focus for synergistic interaction among member companies. Within a park firms with complementary products can share common development expenses, intellectual resources, save shipping costs and transportation delays, and profit by enhanced communication and information flows.

Incentives such as tax holidays, reduced corporate taxes, and duty-free importation of equipment and raw materials are often provided to encourage foreign and domestic investment. Government grants made directly to companies stimulate innovation and research and development, activities often absent in young industries of developing countries. Training programs in the park produce bodies of specialists in such areas as semiconductors and opto-electronics that few companies can afford alone. Specialists may share their expertise among themselves, and can apply their skills to problems of more than one company at a time. Members indirectly share the cost of training such specialists through professional development programs sponsored by the park.

Companies throughout the world are solicited to encourage them to spawn member businesses that will transfer technology to the industry and host nation. Incubators contained within the park generally accommodate first, and even second tier start-up companies. Modular factories and office buildings are provided for firms too small to build their own.

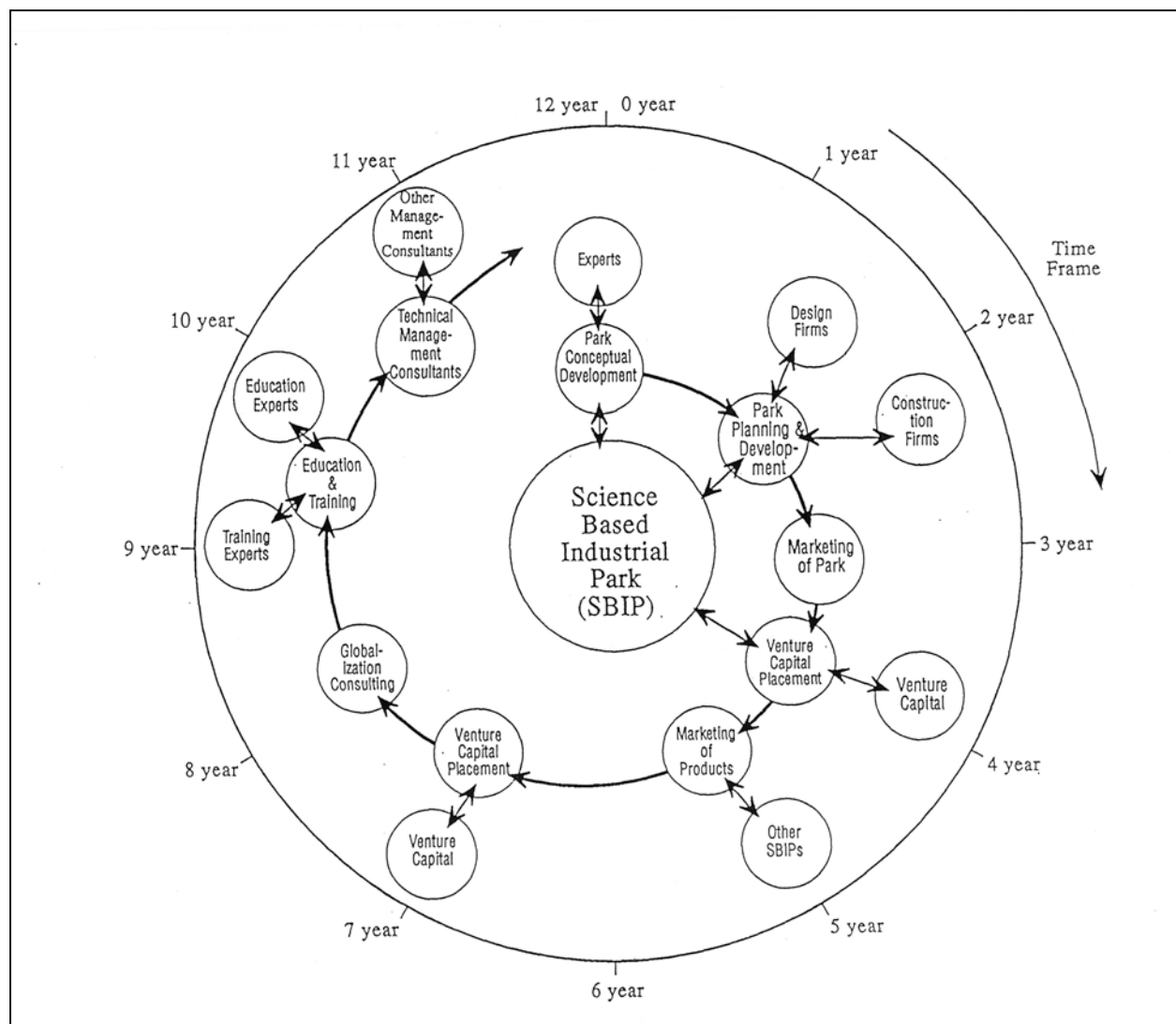
Parks try to maintain a balance of research, development, and manufacturing in order that members are able to sustain their own growth, to wean themselves from licensing or copying foreign products, and eventually to mature into independent technology product developers themselves.

Services provided to members by the parks include advice, consulting, education, infrastructure improvements and maintenance, and administration. Parks generally have their own housing, restaurants, a post office, banks, shopping, schools, recreation, sports facilities, and entertainment as well. They usually are built near universities and government research institutions to facilitate access to high-level expertise. An

annual service fee is assessed by the park to the various member organizations, which contributes to park expansion and infrastructure upkeep.

## PARK DEVELOPMENT

Science-based industrial parks grow through several stages as they mature. At each stage different types of assistance are needed as shown below:



Within the first three years, development will have progressed from conception through selling the idea to prospective member companies. Initially, experts in specialized technology fields may be required, as well as planners and SBIP theorists. As development proceeds, input from design and construction firms is factored into a more detailed layout of park facilities, and a compilation of technology platforms, services, and primary manufacturing that fits the park's emphasis is made to ensure that the requisite synergism occurs.

Once a projected configuration of the park's operations has been agreed upon, marketing of the park to potential member companies and start-up sponsors is begun. Companies are solicited worldwide to provide the kind of seeding and cross fertilization of new technology and business expertise, as well as the established

economic power that will foster future international trade, carry technical and other skills into the country's workforce, and stimulate additional economic and cultural benefits in the host region.

Around the fourth year, venture capital is sought in earnest and placed with individual companies and park developers. The park is put online and begins to function. Products produced within the park are marketed to the outside world, which may even include other SBIP's with complimentary technologies.

The fourth through seventh years of a park's initial development see its growth continue. Additional venture capital and member companies are connected with each other and integrated into the functioning park.

Between the seventh and ninth years globalization of the park intensifies with a concerted effort to identify, then establish global markets as outlets for the park's products. The park becomes a hub of global activity as more of its member companies expand beyond simple trade into international operations.

As companies within a park mature, they move toward increasingly sophisticated products, advanced research, and more original development. Training is stepped up to supply specialists with advanced technical expertise to accommodate the increasing sophistication of manufacturing and production, and to provide training in long-term operation of high-technology businesses.

Between the ninth and twelfth years it becomes vital to the management of both park and member companies to keep abreast of the accelerating economic and technological output produced by a science-based park as it hits its stride.

At each stage of development, expert guidance keeps the project on course, helps incorporate new state-of-the-art technology, and tracks developments in political and financial circles to ensure the park's continued smooth growth.

Glocal Vantage, Inc. is one of few firms worldwide with credentials in SBIP's. As a group we're intimately familiar with every phase of developing and managing science-based industrial parks, and have demonstrated our ability to supply the kind of expertise that can enable an SBIP to become not only successful, but to set the standard to which others aspire.

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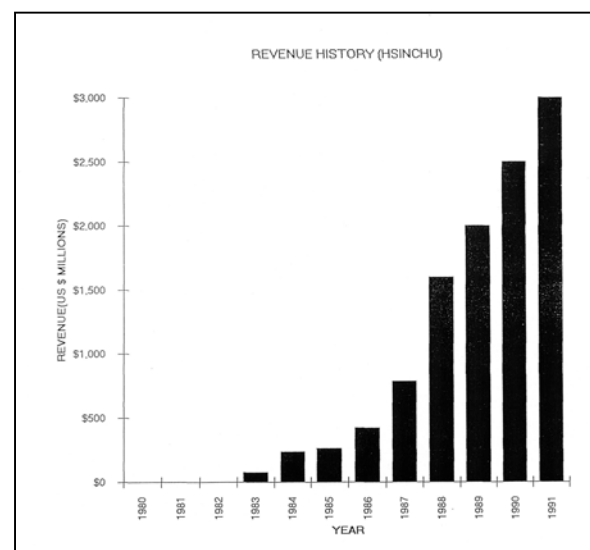
### HSINCHU: A CASE HISTORY SUMMARY

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The first of its kind was a science-based industrial park built at Hsinchu, Taiwan R.O.C., ninety minutes south of Taipei by car. Constructed to approximate a Western-style environment, accommodations include Spanish-style stucco townhouses, a manmade lake, tennis courts, and a Chinese-English bilingual school. The park contains more than 100 companies spread over 1000 acres of what used to be desert land, and there is an additional 400 acres under development.

The park began in 1980, and within four years revenues were US \$73 million annually. By 1991, eleven years after the opening of the park, the annual revenues were US \$3 billion, and climbing at a rate of US \$500 million on an annual basis.

As early as 1989 the park's revenue accounted for almost 1.5 percent of Taiwan's total GNP, and at US \$130,000 per employee, its productivity is fifteen times Taiwan's per capita average, and three times higher than the



nation's electronics industry as a whole.

Originally, Hsinchu was intended to help convert Taiwan's industry from low cost toys and textiles manufacturing to a technology base. By any yardstick it has been successful. Of the 140 or so companies in the park, one-third are computer manufacturers, and the rest makers of integrated circuits, telecommunications, opto-electronics, automation equipment, and other products. Hsinchu's revenues accounted for over 30 percent of Taiwan's entire high-tech output in 1988, making Taiwan the world's sixth largest producer of computer-related products, and second only to Japan as Asia's largest exporter of high tech goods.

The park now employs 23,000 people and continues to grow. Although developers were at first concerned with attracting companies to Hsinchu, they now have literally run out of room at the park so enthusiastic has been the response from such entrepreneurs as the highly successful Microtek International and Logitech Inc. Total investment committed by member companies is US \$3.4 billion, with the government so far investing \$640 million of its own.

Revenue from the park has climbed steadily and for the most part meteorically, averaging 68 percent per year overall since its inception. Its growth rate slowed only briefly during a two-year recessionary period from 1984 through 1986, during which the park's revenue doubled.

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#### AUTHORS

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